Training Masters Students to Advance the Regenerative Medicine Field

Grant Award Details

Training Masters Students to Advance the Regenerative Medicine Field

Grant Type: Bridges

Grant Number: EDUC2-12726

Project Objective: This program provides stem cell training for up to 10 Master's students per year for 5 years at California Polytechnic State University, San Luis Obispo. Training includes coursework, outreach activities, and a 10 month research internship in stem cell and gene therapy science at research institutions and biotech companies.

Investigator:

Name:	Trevor Cardinal
Institution:	Cal Poly Corporation, an Auxiliary of California Polytechnic State University, San Luis Obispo
Type:	PI

Award Value: $3,276,500

Status: Pre-Active

Grant Application Details

Application Title: Training Masters Students to Advance the Regenerative Medicine Field

Public Abstract: Our proposed training program is an interdisciplinary Specialization in Regenerative Medicine, offered within the masters of science (MS) degrees of 3 different departments from 3 academic units, and based upon over 10 years of experience directly training students in this area. The goal of our MS program is to graduate 10-11 day-one ready professionals per year who are capable of advancing CIRM's mission of accelerating regenerative treatments and cures to patients with unmet clinical needs. The first step in achieving this goal is a year of coursework and project experience at our institution, which will prepare students by training them in a variety of skills. Specifically, students will learn to: 1) Perform fundamental laboratory techniques involved in regenerative medicine research & development, including cell culture, cell transplantation, microscopy, and molecular biology. 2) Discuss and critically evaluate biomedical primary literature. 3) Effectively communicate technical topics to peer and general audiences. This will include community outreach with K-12 schools, community colleges, and other community groups. 4) Explain the process of biotechnology development and commercialization. Developing this skill will include exposure to FDA regulatory pathways and other areas of product development ranging from early research to manufacturing and more. 5) Describe how research and development efforts are motivated by and impact patient experiences. This will include direct patient engagement. 6) Design and execute independent research projects, by carrying out a culminating capstone project on campus. Achieving these six learning objectives, along with a practical training course in critical methods of cell manufacturing, will allow students to effectively advance product development and translational research during the second step of our program, which is a 10-month internship at one of our commercial or academic partner institutions. Students will work full-time during these internships, as they refine and further master relevant skills while contributing to a variety of current real-world applications. (The results of our students' previous internship projects have been included in journal publications, conference presentations, patent applications, and regulatory approval documents filed with the FDA.) At the conclusion of our program, students will be poised to enter and directly impact the regenerative medicine field. Therefore, this award will allow us to contribute to CIRM's mission of accelerating treatments to patients with unmet clinical needs by providing the crucial workforce with specialized skills.

Statement of Benefit to California:	Our proposed program will benefit California in several ways, beginning with the first beneficiaries- the students in the program. Through our broad recruitment strategies, we will attract a diverse cohort of students to benefit from the comprehensive training and 100% employment placement historically achieved by our program. The activities of our student cohorts will in turn benefit countless Californians by accelerating stem cell treatments to patients with unmet medical needs. This contribution depends upon this grant allowing us to deliver a pre-internship curriculum that would not be possible without CIRM support, and that provides highly effective preparation for the internship. As a result of this preparation, students at their internships can help advance both translational research and product development, and accelerate the identification of new therapeutic targets or strategies. Without CIRM support, most internship opportunities would not be possible, as the start-up companies developing regenerative treatments and cures are often without the revenue stream required for an internship program. In this way, our program accelerates the development of stem cell treatments by providing regenerative medicine companies with the technically-skilled emerging professionals needed to development new therapies. The regenerative therapies and cures that our students and future alumni help develop will directly benefit Californians who receive these innovative medicines, while also indirectly benefiting the entirety of our state by growing and strengthening California's economy. Graduates of our program have historically impacted, and will continue to impact, a number of fields, such as performing fundamental and translational research in academic laboratories and for-profit companies, developing and manufacturing regenerative medicine products at for-profit companies, and participating in clinical-trial organization at large medical centers. Our graduates will help position California as the world leader in regenerative medicine by providing the workforce necessary for this field, and the economic benefits of this outcome are great. Beyond the students that matriculate into our program and the benefits they impart, our outreach activities will also help build a diverse 'pipeline' by motivating students in K-12 schools and community colleges to pursue bachelors and advanced degrees in the fields that support regenerative medicine. These outreach activities will develop awareness, support, and enthusiasm among the general public for regenerative medicine. In summary, our program will benefit students and patients, help strengthen California's economy, and help build the regenerative medicine talent pipeline with the promise of a rewarding career and the chance to enhance medical practice and treatment options.